REMARKS/ARGUMENTS

This Amendment is in response to the Office Action dated July 9, 2003. Claims 1-19 are pending in the present application. Claims 1-19 have been rejected. Claim 1, 3, 5, 7-8, and 18 have been amended to further define the scope and novelty of the present invention, for clarification, as well as to correct typographical and grammatical errors. Support for the amendments to the claims is found throughout the specification, and in particular, in Figure 4, and on page 10, lines 10-17. Applicants respectfully submit that no new matter has been presented. Claims 2, 4, 6, 9-17, and 19 have been canceled. Accordingly, claims 1, 3, 5, 7-8, and 18 are pending. For the reasons set forth more fully below, Applicants respectfully submit that the claims as presented are allowable. Consequently, reconsideration, allowance, and passage to issue are respectfully requested.

Applicants have included a Petition for Extension of Time to extend the deadline for filing a response by one (1) month, from October 9, 2003 to November 10, 2003.

Claim Rejections - 35 U.S.C. §112

The Examiner has stated:

> **Claims 4, 5, 11 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**
> **Claims 4 and 5 recites the limitation "the original first voltage" in line 1. There is insufficient antecedent basis for this limitation in the claim.**

In response, claims 4 and 11 have been canceled and claims 5 and 12 have been amended to address the above-referenced rejections. Specifically, the phrase "original first voltage" has been replaced with the phrase "minimum operating voltage." Applicants respectfully submit that claims 5 and 12, as amended, are definite under 35 U.S.C. 112, second paragraph.

Claim Rejections - 35 U.S.C. §102

The Examiner has stated:

> Claims 1-19 are rejected under 35 U.S.C. 102(a) as being anticipated by
> F ss et al.
> Foss et al. discloses a circuit and method having all the elements and steps
> as recited in claims 1-19 as follows:
> - an enhanced driver (column 2, lines 20-22) that provides a first voltage
> (output voltage, column 2, lines 20-21);
> - a detector (column 2, lines 31-32) wherein the detector monitors the first
> voltage and wherein if the first voltage falls below a predetermined value (the
> required word line voltage, column 2, line 36), the enhanced driver increases the
> first voltage to at least an optimal voltage (the correct word line voltage, column 2,
> line 36);
> - the bootstrap circuit (column 2, line 28).

Applicants respectfully traverse the Examiner's rejections. For the Examiner's

convenience, amended independent claims 1 and 18 are reproduced in their entirety herein

below.

Claims 1 and 18

1.   (currently amended) A circuit comprising:
        a word line driver that provides a first voltage;
        a switch coupled to the word line driver;
        a detector coupled to the switch; and
        a programmable bootstrap circuit coupled to the switch, wherein the detector monitors the
first voltage, and wherein if the first voltage falls below a predetermined value, the switch causes
the word line driver to output an optimal voltage provided by the programmable bootstrap circuit.

18.   (currently amended) A method for providing a circuit for optimizing power consumption
and performance of a driver circuit, the method comprising the steps of:
        (a)   providing a first voltage with a word line driver;
        (b)   detecting the first voltage; and
        (c)   providing a switch coupled to the word line driver and to a programmable
bootstrap circuit, wherein if the first voltage falls below a predetermined value, the switch causes
the word line driver to output an optimal voltage provided by the programmable bootstrap circuit.

The present invention provides a circuit that comprises a word line driver that provides a

first voltage. The circuit also comprises a switch coupled to the word line driver, a detector

coupled to the switch, and a programmable bootstrap circuit coupled to the switch. The detector

monitors the first voltage. If the first voltage falls below a predetermined value, the switch causes the word line driver to output an optimal voltage provided by the programmable bootstrap circuit. As a result, a driver circuit is provided that increases the voltage range at which circuits driven by the driver circuit can operate without compromising the power consumption and performance (Summary and page 10, lines 10-17). Foss does not teach or suggest these features, as discussed below.

Foss discloses a boosting circuit for providing a continual boosted voltage for a DRAM word line. The circuit can be used to drive the word line as high as $2V_{dd}$. Transistors in the boosting circuit are fully switched, eliminating reduction of the boosting voltage by V_{tn} through the transistors. Boosting capacitors are charged by V_{dd}. A regulator detects the word line driving voltage and maintains the boosted voltage by regulating a voltage boosting pump (Abstract).

However, Foss does not teach or suggest a switch coupled to a word line driver and to a programmable bootstrap circuit, "wherein if the first voltage falls below a predetermined value, the switch causes the word line driver to output an optimal voltage provided by the programmable bootstrap circuit," as recited in amended independent claims 1 and 18. Referring to Figure 4 of the present invention, the switch is coupled to the word line driver and to the programmable bootstrap circuit. In contrast, referring to Figures 3 and 6 of Foss, Foss does not teach or suggest the switch or the word line driver. Foss is instead directed to a boosting circuit 39. While the boosting circuit of Foss can be used as a conventional bootstrap circuit, the boosting circuit of Foss cannot replace the entire circuit as recited in amended independent claims 1 and 18. Since Foss does not teach or suggest the switch and word line driver, Foss fails to teach or suggest the circuit as recited in the present invention, "wherein if the first voltage falls

below a predetermined value, the switch causes the word line driver to output an optimal voltage provided by the programmable bootstrap circuit."

Furthermore, the boosting circuit of Foss maintains a continually boosted word line voltage that can be as high a $2V_{dd}$ (column 2, lines 20-47). The problem with the boosting circuit of Foss is that it provides a boosted voltage all the time in order to achieve higher performance. As a result, the boosting circuit consumes excess power (specification, page 4, lines 15-21). Continually boosting the word line voltage is expected because DRAM circuits need to be boosted all the time to achieve higher performance. This continuous boosting is what the present invention avoids by using the combination of the switch, word line driver, and programmable bootstrap circuit, as recited in the present invention, to provide an optimal voltage if the first voltage falls below a predetermined value.

Therefore, Foss does not teach or suggest the *cooperation of elements* as recited in amended independent claims 1 and 18, and claims 1 and 18 are allowable over Foss.

Remaining dependent claims

Dependent claims 3, 5, and 7-8 depend from amended independent claim 1, respectively. Accordingly, the above-articulated arguments related to claims 1 apply with equal force to claims 3, 5, and 7-8, which are thus allowable over the cited reference for at least the same reasons as claim 1.
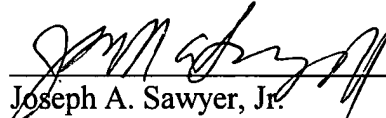
Conclusion

In view of the foregoing, Applicants submit that claims 1-3, 5, 7-8, and 18 are patentable over the cited reference. Applicants, therefore, respectfully request reconsideration and allowance of the claims as now presented.

Applicants' attorney believes that this application is in condition for allowance. Should any unresolved issues remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

Respectfully submitted,

SAWYER LAW GROUP LLP

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Date

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